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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,506	08/28/2003	Daniel T. Mudd	12252-0011	2200

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EXAMINER

KRISHNAMURTHY, RAMESH

ART UNIT	PAPER NUMBER
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3753

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/652,506

Applicant(s)

MUDD ET AL.

Examiner

Ramesh Krishnamurthy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 20 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1 - 20 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

This office action is responsive to amendment filed 05/10/2005.

Claims 1 – 20 are pending.

1. Applicant's claim for domestic priority under 35 U.S.C. 119(e) is acknowledged. Applicant appears to have complied with conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 119(e).

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 13 – 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 recites the limitation "the pressure sensor" in line 4. This limitation lacks sufficient antecedent basis in the claim.

Claim 13 recites the limitation "an incremental pressure per unit of flow" at line 5. This limitation is unclear. In this office action the limitation " an incremental pressure per unit of flow" has been interpreted to mean that the restrictor is capable of allowing low flow rates with attendant pressure drop therethrough.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1 – 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Loan et al. (US 5,868,159) or Balazy et al. (US 6,152,162).

6. Loan et al. discloses a mass flow controller, comprising: a body portion having a first internal passage (12) and at least second internal passage (30,32) formed therein; a flow control valve (18) coupled to the body portion and in communication with the first and second internal passages; at least one pressure transducer (40,42) coupled to the body portion and in communication with at least one of the first internal passage and the second internal passage; a nonlinear flow restrictor (20) configured to produce a high compressible laminar flow therethrough coupled to the second internal passage; a thermal sensor (38) in communication with at least one of the first internal passage, the second internal passage, and the flow restrictor; and an exhaust vessel (6) in communication with the flow restrictor. It is noted that the exhaust vessel (6) being a vacuum deposition chamber is inherently configured to be under a variety of pressures. Also the restrictor (20) is taken here to include all known restrictors including those made of sintered metal with a porous structure as well as those selected from the group consisting of capillary tubes, annular gaps, annular plates, parallel plates, grooved plates, stacked plates, coiled capillary bodies, and coiled sheets. Also since the pressures upstream and downstream of the restrictor could span a range of values, the

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device disclosed by Loan et al. is configured to deliver a flow such that the pressure drop across the restrictor is 50% of the pressure at the restrictor inlet i.e. a highly compressible laminar flow. Figure 1 shows the restrictor to be clearly non-linear.

Balazy et al. discloses a mass flow controller, comprising: a body portion having a first internal passage (26b) and at least second internal passage (26a) formed therein; a flow control valve (34) coupled to the body portion and in communication with the first and second internal passages; at least one pressure transducer (14,16) coupled to the body portion and in communication with at least one of the first internal passage and the second internal passage; a nonlinear flow restrictor (28) configured to produce a high compressible laminar flow therethrough coupled to the second internal passage; a thermal sensor (considered inherent to the system of Balazy et al. and included in "the other process data" mentioned at Col. 9, lines 44 – 45) in communication with at least one of the first internal passage, the second internal passage, and the flow restrictor; and an exhaust vessel (6) in communication with the flow restrictor. It is noted that the exhaust vessel (connected to outlet (24)) in a semi-conductor manufacturing facility (see col. 1) is a vacuum deposition chamber that is inherently configured to be under a variety of pressures. Also the restrictor (28) is taken here (see col. 10, lines 14 – 21) to include all known restrictors including those made of sintered metal with a porous structure as well as those selected from the group consisting of capillary tubes, annular gaps, annular plates, parallel plates, grooved plates, stacked plates, coiled capillary bodies, and coiled sheets. Also since the pressures upstream and downstream of the restrictor could span a range of values, the device disclosed by Balazy et al. is

configured to deliver a flow such that the pressure drop across the restrictor is 50% of the pressure at the restrictor inlet i.e. a highly compressible laminar flow. Figure 2 shows the restrictor to be clearly non-linear.

7. Claims 1 – 20 are rejected under 35 U.S.C. 102(a) as being anticipated by White et al. (WO/02/25391).

8. Claims 1 – 20 are rejected under 35 U.S.C. 102(e) as being anticipated by White et al. (US 6,539,968 B1).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

White et al. (WO 02/25391 or '968 patent) discloses a mass flow controller, comprising: a body portion having a first internal passage (42) and at least second internal passage (44) formed therein; a flow control valve (40) coupled to the body portion and in communication with the first and second internal passages; at least one pressure transducer (46,48) coupled to the body portion and in communication with at least one of the first internal passage and the second internal passage; a nonlinear flow restrictor (56) configured to produce a high compressible laminar flow therethrough coupled to the second internal passage; a thermal sensor (78) in communication with at least one of the first internal passage, the second internal passage, and the flow

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restrictor; and an exhaust vessel (36) in communication with the flow restrictor. It is noted that the exhaust vessel (36) being a vacuum deposition chamber is inherently configured to be under a variety of pressures. Also the restrictor (56) is taken here to include all known restrictors including those made of sintered metal with a porous structure as well as those selected from the group consisting of capillary tubes, annular gaps, annular plates, parallel plates, grooved plates, stacked plates, coiled capillary bodies, and coiled sheets. Also since the pressures upstream and downstream of the restrictor could span a range of values, the device disclosed in WO 02/25391 or in the '968 patent is configured to deliver a flow such that the pressure drop across the restrictor is 50% of the pressure at the restrictor inlet i.e. a highly compressible laminar flow. Figure 4 shows the restrictor to be clearly non-linear.

In rejecting the claims 13 – 20 above, the limitation “ an incremental pressure per unit of flow at the inlet at low flows” has been interpreted to mean that the restrictor is capable of allowing low flow rates with attendant pressure drop therethrough.

Response to Arguments

9. Applicant's arguments filed 05/10/2005 have been fully considered but they are not persuasive. Applicant's argument is that none of the cited references discloses (a) a restrictor having a highly compressible laminar flow therethrough and (b) a restrictor that is configured to have an incremental pressure per unit of flow at the inlet at low flows. However, each of the references cited discloses a non-linear restrictor that is inherently capable of generating a range of pressure drops therethrough including that corresponding to a highly compressible laminar flow as disclosed in the instant

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application. As for the limitation "a restrictor that is configured to have an incremental pressure per unit of flow at the inlet at low flows" it is noted that this limitation is unclear and to the extent it has been understood and interpreted in this office action, the limitation is considered to be inherent to cited references since each discloses a restrictor that is capable of a flow rate of a wide range including low flow rates.

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

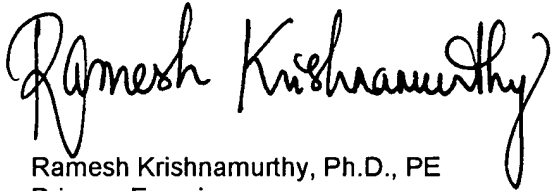
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramesh Krishnamurthy whose telephone number is (571) 272 – 4914. The examiner can normally be reached on Monday - Friday from 10:00 AM to 6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gene L. Mancene, can be reached on (571) 272 – 4930. The fax phone number for the organization where this application or proceeding is assigned is (571) 273 – 8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, reading "Ramesh Krishnamurthy". The signature is fluid and cursive, with the first letter of each name being capitalized and prominent.

Ramesh Krishnamurthy, Ph.D., PE
Primary Examiner
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